FOR MYSORE STATE

Revenue (1950) Department.

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G.O. NO. 2073

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[Despatch Abstract.]

Rainguage - Meteorology - Collection
& Hydrological data Installation
& rainguage - sanctioned.

No. 4167/?.58.

CENTRAL BOARD OF IRRIGATION.
"Kennedy House",
Simla S.W., the 12th April, 1946.

From

N.D. Gulhati, Esq., I.S.E., M.I.E. (Ind)
Secretary,
Central Board of Irrigation.

To

The Secretary to the Government of India,
Department of Works, Mines and Power,
New Delhi.

Sub: (i) Observation and Record of Rainfall and Snowfall.
(ii) Analysis of Rainfall Data.
(iii) Stream gauging and observation of discharges.

....

Sir,

During the last few years, a number of technical papers have be presented to the meetings of the Research committee of the Board, during the discussions on which it was forcefully brought to notice, that:

(i) the number of rain gauge stations in India is very inadequate;

(ii) the system of recording rainfall and snowfall requires to be improved in many respects;

(iii) the data that is being collected, is not being analysed on any scientific basis;

(iv) Stream gauging is not being done on as extensive a scale as is necessary;

(v) The record of stream gauging is not being published in a systematic manner.

2. The Board has had these questions under examination for the last few years. At its last meeting, it had the advantage of discussing them with Dr. S.K. Bannerjis, Director General of Obervatories ~~xk~~ in India. As a result of these discussions, the Board has arrived at certain conclusions and I am directed to convey to the Government of India the following recommendations of the Board:-

A. Rain Gauges.

(i) Location. The installation of new gauges should be arranged, wherever possible, in grid formation with sides of 25 miles, with ~~local~~ adjustments to suit topographical and meteorological features.

(ii) Type. An integrated type be used for inaccessible ~~localities~~ Localities.

At other places, the standard type of raingauge adopted by the Meteorological Department should be used with 10% of the integrated type.

Where facilities exist, the duration of heavy rainfall should be recorded.

B. Snow Gauges.

(i) Location. Location of Snow Gauges should be fixed in consultation with the Meteorological Department up to a maximum elevation of 20,000 feet above sea level. The Gauges should be raised sufficiently high, above the ground, to avoid being buried in snow.

(ii) Type. Snow should be recorded separately from rain and in areas where snowfall occurs the Fergusson Weighing recording rain and snow gauges should be used.

C. Agencies.

Agencies for installing and operating rain and snow gauges should be decided in consultation between:

(i) India Meteorological Department:
(ii) Provincial and State Governments concerned; and
(iii) The Central Waterways, Irrigation and Navigation Commission.

The Board recommends that Sub-Committees representing these interests should be formed - one for each catchment.

The Indian Meteorological Department should be requested to undertake collection, examination and publication of data, in consultation with the sub-committee to be appointed for each catchment.

D. Stream Gauging.

Agency. The gauging of any stream which affects more than one province or state should be the concern of the Central waterways, Irrigation and Navigation Commission.

Other streams should be gauged by the local authorities concerned on as extensive a scale as possible.

Method. The Board recommends the installation of automatic self-recording stations at key points.

E. Computation of Maximum Discharge.

The Board is unable at present to recommend any specific method for calculating the maximum probable discharges of a stream. To enable it to make definite recommendations in thi respect provinces and states are being requested to furnish the data available with them to the Research Committee of the Board in the Form enclosed.

5. I am further directed to request that necessary action may kindly be taken by the Government of India to implement the recommendations of the Board in so far as it concerns the Central Government and the Indian States. A copy of this letter is being sent to all provincial Governments for necessary action in so far as it concerns them.

4. I enclose 12 spare copies of the letter for the Indian Waterways, Irrigation and Navigation Commission, the Posts and Air Department and for the Political Department.

(Sd.) xxxxx
Secretary,
Central Board of Irrigation.

2. The integrating .. accessible localities; also at least 10 percent of all rain gauges in a catchment should be of this type.

The determination of the number of rain gauge station in a catchment and their distribution should be treated as a problem in large scale sampling. For the present, the aim should be to

obtain data correct within 10 percent.

REVENUE DEPARTMENT.
Subject.

Irrigation - Central Board of Irrigation - Meeting of the Research committee and of the Board - Rain gauges, Snow-gauges etc., Recommendations - Report submitted.

No.Ref.H.1675/47-1, dated14.6.47.

Station: Madras.
From

C.A. Ramakrishnan, Esq., I.C.S.,
Joint Secretary, Board of Revenue.

Sir Gerald Priestly, K.C.I.E., I.C.S.,
Commissioner of Land Revenue and Irrigation.

Read the following:-

1. Government Endt. No.2154-J/46-1, Public works dated 23-4-46.
2. From the Chief Engineer for Irrigation, Madras No.1561/46-M-3, dated 7.2.47.
3. From the Government P.W.D. End. No.716 N/46-6 dated 29-4-47.

Reference.

The Board submits to the Government the report of the chief Engineer for Irrigation, Madras on the question of implementing the recommendations of the Central Board of Irrigation. Of the several recommendations, the Board is concerned with only those regarding the raingauges and the compilation and analysis of rainfall data. They are dealt with below:-

2. Location of raingauges. The first recommendations of ... Central Board of Irrigation regarding raingauges is that new raingauges should be arranged wherever possible in grid formation with sides of 25 miles. Apparently the intention is that where the distribution of raingauges is sparse, necessitating the installation of now raingauges, this recommendation may be followed. For this purpose an examination of the number of raingauges distributed over the various parts of the Province and the states was made with the help of a map drawn over meshes of 25 x 25 miles. A statement showing the theoritical and the actual number of gauges in each district is enclosed. It will be seen from the statement that the existing number of raingauges in each district or State for exceeds the theoritical number of raingauges. The total number for the region is 719 as compared with the theoritical number of 238. However, it does not necessarily follow that the actual distribution conforms to the 25 miles grid formation. In a particular region it may happen that the distribution of raingauges is extremely dense while in another it is extremely spare, although the total number of raingauges within it is large. Chief Engineer for irrigation has stated in his report that distribution of the rain gauges conforms fairly well to the recommendations of the Central Board of Irrigation, except in som parts of the Ceded districts, Nellore and the Circars. It will be seen from the statement enclosed, that even in the districts the actual number of raingauges exceeds the theotrical number. As already observed this does not prove

that the distribution conforms to the 25 miles in these districts. It is very likely that the present distribution of raingauges is much denser than the 25 miles grid proposed except, perhaps in hilly areas like Anamalais, The Nilgiris and the Agency portions of Vizagapatam and East Godavari and Anantapur. The Board considers that it is in these hilly tracts where the rainfall varies from mile to mile and where valuable plantation crops are grown that the distribution of raingauges ought to be denser than in these expected areas may be considered and where it is difficult to find competent Government servants to record the rainfall and be in charge of the raingauges in these areas, the best possible nonofficial agency, e.g., planters, influential ryots, etc., may be availed of for the purpose. The Board considers that the most of the estates in the Anamalais and the Nilgiris might be maintaining their own raingauges and rainfall recorded.

The chief engineer for Irrigation has stated in his report that the superintending Engineers have been instructed to inspect localities where additional rain gauge stations are considered necessary province are under the administrative control of the Board, the P.W.D. the Central Excise Department and the Meterological Department, it is desirable that all these departments co ordinate and investigate the question of opening new stations.

5. The Board agrees that the integrated type of raingauges may be used in inaccessible localities. The integrated type in a self recording raingauge. Inaccessible localities are localities where a responsible person competent to record readings daily, could not be found living at the place. In other places the standard type or raingauges may be used with 10 percent of the integrated type. The substituion of the integrated type of raingauges in place of the existing standard type gauges need be only gradual, as it is not worthwhile setting aside the existing raingauges.

The Board also observes that the area where information about rainfall is most needed is the hilly tract in Trichinopoly and Madura, stretching from Kadavur down to Ramnad. It is as prolific a source of bad floods as the board is aware of. The only raingauge station of real interest in this area is that at Palaviduthi and there the rainfall is recorded by a police constable. The Board considers it desirable to have self recording raingauge installed at this place as the floods that originate from that neighbourhood seem to warrant it.

4. Recording the duration of heavy rainfall:
The Board has no objection to arrange for the recording of the duration of heavy rainfall where facilities exist for doing so.

REVENUE DEPARTMENT.
SUBJECT.

rrigation - Collection of Hydrological data Recommendation of the entral Board of Irrigation and the meeting between the Central aterways, Irrigation and Navigation commission and the Meteorologic epartment - Report - Submitted.

B.P.Rt.5602/47

tation: Madras. Dated 25.9.47.

rom

. A. Ramakrishnan Esq.,
Joint Secretar

. N. Kudva Esq., C.I.E., I.C.S.,
Commr. of Land Revenue, Excise and Prohibition.

ead: 1. Government Endorsement No.982 N/47-4, Public Works dated 7.7.
2. Government Memo No.716 N/46-7 Public Works dated 7.7.47.
3. From the Chief Engineer for Irrigation No.4456/45-M-13, dated 6.5.47.
4. From the Chief Engineer for Irrigation No.1561/46-M-14,

dated 27.6.47.
5. Board's Ref:H.1675/47-1. dated 14.6.47.

RESOLUTION.

The Board submits to the Government the report of the Chief Engineer for Irrigation on the revised recommendations of the Central Board of Irrigation.

Of the several recommendations made by the Central Board of Irrigation and the meeting ~~xx xxx~~ between the Central Waterways, Irrigation and Navigation Commission and the Meteorological Department, the Board is concerned only with the following:

a) Maintenance and distribution of Raingauges in the Province.
b) Agency for the compilation and publication of rainfall data.
c) Inspection of Raingauge stations.
They are dealt with below.

a) Maintenance and distribution of raingauges in the Province.

The Board agrees with the Chief Engineer for Irrigation as to the general policy laid down in paras 4 and 5 of the minutes of the meeting between the Central Waterways, Irrigation and Navigation Commission and the Meteorological department regarding the allocation of capital and recurring charges incurred in respect of raingauge the standardization of the instruments and methods of observation and record. In this connection the Board submits that the capital and recurring charges in respect of raingauges under the control of Government departments are being met from Provincial Revenues and that the recording of rainfall data, erection of new raingauge stations, etc, are being done in accordance with the instructions contained in the pamphlet "The Rainfall Organization" published by the Meteorological department.

In its reference read above, the Board has already examined in detail the question of erecting additional raingauge stations and the installation of an integrated type of raingauges and has recommended to Government, ~~xx~~ the erection of integrated types of raingauges in inaccessible localities where a responsible person competent to record readings daily could not be found living at the place.

(ii) the use of the standard type of raingauge with 10% of the integrated type in other places,

(iii) the installation of a self-recording raingauge at Palaviduthi station in Trichinopoly district and

(iv) the erection of more raingague stations in hilly areas like the Anamalais and Nilgiris and the Agency portions of Vizagapatam and East Godavari and in Anantapur district. The Chief Engineer for Irrigation has examined the question of installing additional raingauges in the light of the revised recommendations ~~xxxx

Department may collect, examine and publish all rainfall data The Board considers, however, that it should continue to get the rainfall reports in respect of stations under the control of the Revenue Department the Public Works Department the Central Excise Department, the Meteorological Department and the States, and examine, compile and publish/compiling and publishing additional rainfall data in respect of others raingague stations in the Province if any, may be examined in consultation with the administrations, and departments concerned and additional staff, if necessary, may be appointed after gauging the extra work involved.

Inspection of Raingauge stations:

The Chief Engineer for Irrigation has suggested that a Provincial Officer of the grade of Executive Engineer will be a better choice that the Meteorological Department for purposes of Inspection of ~~stations with reference to their location, usefulness~~ Raingauges as the former can cause better and effective inspection of such stations with reference to their location, usefulness and facilities for maintaining correct records. The raingauges which are under the control of the Board, the Public Works Department, the Central Excise Department the Meteorological Department and the States are now being inspected at least once a year by the officers of the respective departments. The Board is of the opinion that the raingauges under control of the various departments should, as at present, continue to be inspected periodically by the officers of the respective departments and that the heads of the departments concerned should review periodically the inspection reports received from their subordinates. An officer of the rank of Executive Engineer ~~xx~~ may be appointed as a Provincial Officer for co-ordinating the rainfall work done by the several departments having control over raingauge stations in this province. As the Statistical Branch of the Board of Revenue is at present compiling the hydrological data in respect of this Province it is desirable that this Provincial Officer, should work under the Board of Revenue in the Statistical Branch.

The Board has recently examined the question of appointing whole time Inspectors for inspecting all the raingauges under its control and it has suggested in its D.Dis.S.No.1080/47 D/10-4-47 the Deputy Director General of Observatories that 4 whole time Inspectors would be requred on the assumption that touring will be restricted to about 6 months in a year. The Board considers tl the appointment of the 4 Inspectors is sanctioned they should also be under the control of the Board.

The Board agrees with the Chief Engineer's remarks on the other points referred to in his letter~~x~~ last cited above.

(Sd.) xx xxx
for Joint Secretary.

Copy of letter No.2561/46-M-14, dated the 27th June, 1947, from the Chief Engineer for Irrigation, Public Works Department, Madras, to the Secretary to Government, Public Works Department, through the Board of Revenue.

Sub: Hydrologic data - Reference from Secretary, Central Board of Irrigation regarding collection of

Ref: P.W.D. Endorsement No.716-M/46/6, dated 29-4-47.

In continuation of my letter No.1561/46-M-3, dated 2-2-47 which is a reply to the Government's previous Endorsement No.215~~2~~-J/46 dated 23-4-1946, I offer the following further remarks on the recommendations of the Central Board of Irrigation.

the existing rainfall stations, integrated type of rainfall gauge which will usually record the falls of a week continuously will be desirable. These gaguges will also be useful in recording intensity. I am taking up this question with the Superintending Engineers and the local P.W.D. officers have also been requested to consult the Revenue Department. A further report on this question will be sent to Government in due course.

(B) & (C): Snow gauges and surveying: Not applicable to Madras Presidency.

(D) Temperature and humidity: The installation of stations at salient points may be left to the meteorological department, the Provincial Government financing only such of those new stations as are necessary and useful for agricultural operations etc.

(E) Agency: The policy to be adopted in regard to the function and composition of the Committee for collecting information has to be decided by the Government - vide my previous letter under (C) & (D) Agencies.

II. Stream gaugings: Agency responsible for co-ordinating the data of streams affecting more than one state may be the Central Waterways, Irrigation and Navigation Commission. Installation of Automatic self recording gauges at key points is being considered and when a decision is come to, a report will be sent to Government.

As regards data on flow of streams and rivers, as far as Madras Presidency is concerned systematic collection of data is being done and the data are embodied in the annual river diagrams of important rivers recorded in the office of the Chief Engineer for Irrigation. No more collection is necessary. It is left to the Board to utilise the information given in the book-let sent as enclosures to my letter referred to in the 1st para of this letter. On receipt of orders of Government to forward a copy of the booklet to Central Board of Irrigation necessary action will be taken pointing out to the Board at the same time that the Collection by the Committee specially formed for Damodar catchment for studying rainfall intensity and resulting run-off.

III. Groundwater supplies: This question may be taken up by the Directors of Agriculture and Industries. As regards study of the regeneration in rivers, special staff is necessary and hence, cannot be taken up till staff position improves.

IV. Evaporation: The Suggestion of the Board to leave this investigation to the Indian Meteorological Department may be accepted.

V. Infiltration and subsoil flow: The suggestion of the Board to undertake this study by the Irrigation Research Institutes and by the staff at the farms of the irrigation department may be considered some time later as there is no organisation at present to deal with such question effectively.

VI. Research and Standardization: No remarks.

VII. Inspection Agencies: The suggestion to expand the ACTIVITIES OF THE Meteorological Department so as to include within its range annual inspection of rain gauge stations is not acceptable. A provincial officer of the grade Ex of Executive Engineer who can cause better and effective inspection of such stations with reference to their location, usefulness and facilities for maintaining correct records is the best choice. Besides the same Provincial Officer can be asked to inspect in addition various stations or sites chosen for determining discharges of streams by current meters, velocity rods etc. - Vide also my letter No.459/47-E-9, dated 26-5-1947 regarding the necessity for a new Division for collecting Hydrologic data.

Early formation of a new Division will greatly help in collec-

(Abstract)

Raingauge - Meteorology - Collection of Hydrological data - Installation of raingauge - Sanctioned.

G.O.Ms.No. 2073. REVENUE DEPARTMENT. Dated 29.7.1950.

Read:

From the Board of Revenue Ref: H 1675/47-1 dated 14-6-47.
From the Board of Revenue Ref: R.P. 5602/47 dated 25-9-47.
From the Chief Engineer for Irrigation letter No. 1561/46-M-21 dated 2-5-48.
From the Board of Revenue Res.(Rt.) No. 1064/50 dated 21-2-50.
From the Board of Revenue letter No. L Dis. 4841/50 dated 18-6-50.

The Government sanction the installation in the Madras State, of ten additional raingauge at a total cost not exceeding Rs.6540/- (Rupees Six thousand five hundred and forty only). One of the gauge will be of the integrated (automatic) type of rainfall recorder and will installed at Periyar Dam site while the remaining nine will be of the ordinary type and will be installed one at each of the following stations:-

(1) Peddakattu (near Kothakota Village) (Visakhapatnam District)
(2) Hosahalli (Bellary district)
(3) Tornagal (Bellary district)
(4) Betamcherla (Kurnool district)
(5) Marrivemla (Kurnool district)
(6) Perur (Anantapur district)
(7) Sankarapuram (South Arcot district)
(8) Palaividudi police station (Tiruchirapalli distr
(9) Gollapuram (Mathurai district)

2. The Board of Revenue is requested to make necessary arrangements to have the raingauges installed, in consultation with the Chief Engineer for Irrigation.

3. The expenditure should be debited to "25. General Administration - District Administration and Miscellaneous.

(BY ORDER OF HIS EXCELLENCY THE GOVERNOR)

K. M. Unnithan,
Secretary to Government.

To the Board of Revenue.
To the Accountant General through Finance department.
the Chief Engineer for Irrigation.

(True Copy)

SUPERINTENDENT.